High-End Phaco Systems: A Comparison

Dr. Ashley Thomas Jacob  MS DNB MRCOphth

High End Phaco: Excellence at your finger tips

There are several high end phaco designs available in the market today. I have ventured to analyze only those that offer some value and uniqueness that would help the individual surgeon in bettering his technique and enable superior marketing of his surgical unit.

In this issue, the spotlight is on three designs that have superior degree of innovation and have dominated scientific meetings in US, Europe and in India.

Oertli Os3

Country of Origin: Switzerland
Website: www.oertli-instruments.com
Sold & Serviced by: Toshbro Medical Equipments

Oertli has been a leader in innovative concepts that are rarely well marketed in India. The quality of its product range has been never justified by the various distributors handling its products. This has been the failure of an otherwise exceptional product.

Oertli has several innovations to its name like the 6-crystal Handpiece, Co-MICS (coaxial micro phaco), dual linear foot pedal, etc.

User Interface: Large LED display and push button control &Audio. The display unit is a dated design that cries out for change.

I/A System: The OS3 fluidics system comes with the TwinVac cassette (250ml) and integrated pressure sensor. The cassettes are available as single use or autoclavable and these can be emptied.

Venturi and peristaltic double pump switchable (from pedal, remote control or panel) during surgery with the dual function cassette that supports both pumps.

Air free fluidics system: The absence of air in the aspiration path has multiple advantages like immediate response to pressure changes, instant build up of suction power and stable anterior chamber.

Oertli claims to employ an AC Guard system that eliminates vacuum surges completely even at highest levels of vacuum. The company says that there is no possibility of contaminations from pressure sensor as pressure is sensed without contacting the aspiration liquid.

Reflux function is selectable, from bottle or with pump reverse (150ml).

Ultrasound Phaco: Six-Crystal Design Phaco hand piece.
CMP - cool phaco mode for bimanual cool micro incision phaco.

Bipolar Klöti RF-capsulotomy: This form of capsulotomy is unique to Oertli designs.

Anterior Segment Vitrectomy: Single use guillotine cutter with selectable cutting rate of upto 1200 cuts/minute. Extendable to Vitreoretinal Surgery

Dual Linear Pedal: The programmable dual linear pedal is equipped with its own controller. Not only can you assign preferred functions to the various pedal elements, you can also individually set the position points and the resistance at the position points.

*Skill Enhancement needed: NONE
Alcon Infiniti

Country of Origin: USA
Website: www.alconlabs.com
Sold & Serviced by: Alcon India

Alcon has consistently provided surgeons with innovative technologies in the field of cataract microsurgery. Although expensive to purchase and maintain, the quality is unmistakable. The groundbreaking Legacy is a case in point. Now, with the Infiniti, we have a worthy successor.

The Infiniti has several innovations like the Ozil Torsional Phaco, AquaLase system, and Alcon’s own version of the micro phaco (Intrepid).

User Interface: Touch screen & Audio

I/A System: Alcon calls it the Fluidic Management System.

Alcon claims that the FMS has a low-compliance (rigid) design with molded fluid paths and thick-wall polymer aspiration tubing that decrease post-occlusion surge and increase fluidic response and accuracy.

The pump mechanism has tapered rollers designed for instantaneous, smooth peristaltic response and has greater pumping capability, with forward and reverse actuation up to 100cc per minute.

Ultrasound Phaco: OZil Torsional Handpiece:

The hand piece delivers side-to-side oscillating ultrasonic movement. With virtually no repulsion, it delivers a level of followability that is unmatched.

Torsional phaco utilizes ultrasonic oscillatory movement that can benefit lens removal for all lens densities. The unique movement of torsional phaco shears the lens material, providing decreased repulsion (no jack hammer effect) while improving the thermal safety profile over traditional ultrasound. There are multiple surgical benefits to decreased repulsion: increased followability, reduced turbulence, and increased cutting efficiency.

Side-to-side movement delivers increased cutting efficiency by emulsifying lens material with both directions of movement which has the potential to reduce fluid usage and increase your surgical efficiency.

Less frictional movements within the incision and lower frequency (32kHz) reduce the risk for thermal injury thus allowing the use of sealed incisions and continuous torsional modes increasing surgical efficiency.

The design facilitates the emerging trend of micro coaxial phaco.

The titanium hand piece with 4 crystals weighs only 60 grams.

AquaLase Liquefaction Device: The innovative AquaLase Liquefaction Device offers an alternative to ultrasound in soft to medium density cataract lenses while claiming reduced surgical complications.

Warmed pulses of BSS sterile irrigating solution are delivered through a smooth polymer tip to delaminate and separate lens tissue. Each pulse is only 4 mL and is delivered in a “scoop-like” energy pattern. The smooth capsule-friendly tip is designed to improve your ocular safety with a “more in the bag” technique. The fluidic pulses are individually made and delivered with no mechanical motion of the tip and the pulse energy density is quickly dampened within the fluid of the anterior chamber, reducing risk to surrounding tissue.

AquaLase allows change of pulse strength by altering volume and velocity; vary pulse rate, and activate burst, with variable rest intervals and decreased repulsion of nuclear material.

INTREPID Micro-Coaxial System: Micro-coaxial System delivers a complete micro-incision solution, allowing the surgeon to perform surgery safely and efficiently through a single incision without altering the normal technique.

*Skill Enhancement needed: Since the Ozil works only with the Kelman tip, the surgeon would have to devote time to re-train himself if used to working with straight tips.

AMO Whitestar Signature

Country of Origin: USA
Website: www.amo-inc.com
Sold & Serviced by: AMO India

User Interface: Touch screen & Audio

I/A System: AMO calls it the Fusion Fluidics. It claims to provide increased chamber stability and safety by anticipating intraocular changes and proactively...
adjusts, so chamber stability is never compromised - even at higher vacuum and flow settings, with any technique, on any lens type.

The Fusion Fluidics surge-prevention technology allows the use of high vacuum and flow settings to reduce phaco time and increase efficiency while improving chamber stability by anticipating occlusions and preemptively adjusting vacuum before occlusion breaks.

The system has the ability to switch between a true peristaltic pump and true venturi pump on-the-fly. During a procedure, the surgeon can switch instantly into venturi mode for additional vacuum and holding power. This capability can be extremely useful in teaching institutions, allowing the flexibility to use both modalities in one system.

**WHITESTAR ICE Technology**

Cavitation is a recognized source of ultrasonic cutting power. When bubbles strike, high energy manifesting as a localized implosion destroys nuclear material.

WHITESTAR ICE Technology is designed to maximize the cavitation potential of phaco energy to optimize surgical technique.

Theoretically, an initial punch at the beginning of each ICE Pulse allows gas-rich BSS to flow between the phaco tip and cataract material, acting as a transient cavitation accelerator.

The ICE Pulse amplitude punch can be from 0% to 12% of total pulse power and can be set to increase, decrease or stay constant in each phaco setting.

**Ultrasound Phaco: Ellips Transversal Ultrasound**

The Signature System now comes with Ellips Transversal Ultrasound as an answer to Alcon’s Ozil. To work around Alcon’s patent, the longitudinal and transversal ultrasound has been simultaneously blended. This, AMO claims, has been designed for efficient cutting that doesn’t require a change in technique and works with any tip style—straight or curved. And it’s true! There is no skill enhancement required unlike with Ozil.

The system is optimized with Micropulse Technology for followability and to minimize the risk of thermal damage.

*Skill Enhancement needed: NONE*

**Conclusion**

Buying a High End phaco system involves a lot of money. So it is wise that such a decision is reached after careful deliberations on the feasibility of such an investment. The bare truth is that the purchase is most often made to satisfy one’s own ego (which is important, but cannot be the sole point on which to base the purchase).

The purchase would be deemed financially viable if the surgeon would be performing a minimum of 30 cases a month. As with any surgical unit, break even has to be achieved by 12-18 months.

Alcon Infiniti would be a good buy if considered purely on the merit of the investment. The unit has a fairly good number of installations and has proved to be largely trouble free. AMO Signature with Ellips would come a close second losing out on the number of installations. Oertli would raise concerns on the distributor’s ability to sustain the unit and their distributorship which could change hands.

Whatever your choice, it has be complimented by good, ethical in-house marketing activities.

(To be continued)